

96-210355/22 D25 E16

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94.10.20 94DE-4437486 (96.04.25) C11D 3/08

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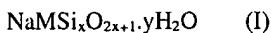
D(11-B3, 11-B11, 11-D1A) E(10-C2A, 31-PSC)

Compsn. for dishwasher contg. layered sodium (poly)silicate - pref. with citric acid and bleach, protecting glass and decorations and removing tea stains.

C96-067202

Addnl. Data: BUCHMEIER W, SORG R, JESCHKE P, NITSCH C, HAERER J

The use of layered silicates of formula (I) in dishwashing compsns. for machines, as decoration and glass protecting component or as additive for increasing the tea-stain removing performance, is new.

 $\text{M} = \text{Na or H};$  $x = 1.9-22$  (pref. 1.9-4, esp. 2); $y = 0-30.$ 

Also claimed is a dish-washing compsn. config. 25-80 (pref. 35-55) wt.% of a builder system of at least two builder substances and 5-20 (pref. 10-15) wt.% of an oxygen-based bleaching agent. The builder

substances are 15-55 (pref. 25-45) wt.% of citric acid (or its alkali metal or ammonium salt) and 0.5-25 (pref. 2-10) wt.% of crystalline (I).

#### ADVANTAGE

The low alkalinity compsn. provides good protection of sensitive articles, esp. glasses and decorated articles, so that no corrosion or damage occurs on repeated washing. Loss of colour intensity and gloss of coloured glazing on porcelain, coloured glass, gold decoration etc. is prevented. Tea stains are also completely removed.

#### PREFERRED COMPOSITION

The compsn. has an alkali carrier system consisting of 10-50 (pref. 20-35)% of a mixt. of  $\text{Na}_2\text{CO}_3$  and  $\text{NaHCO}_3$ , with  $\text{Na}_2\text{CO}_3$  to  $\text{NaHCO}_3$  wt. ratio 1:15 to 2:1. The bleaching agent is a percarbonate salt, pref. sodium percarbonate. The compsn. additionally contains a bleach activator (pref. N,N,N',N'-tetraacetyl-ethylene diamine (TAED)) at 1-10 (pref. 2-6)%, an enzyme at up to 6 (pref. up to 3)% and/or surfactants (pref. low-foaming nonionic surfactants) at up to 6

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(pref. up to 3.5)%. A 1 wt.% soln. of the compsn. in water has pH 8.5-11.0 (pref. 9.0-10.0). The compsn. consists of a powder or granulate of bulk density 750-1000 g/l; or a tablet obtd. by compressing a mixt. of the components under a pressure of  $2 \times 10^7$  to  $1.5 \times 10^8$  Pa in a tableting press.

#### EXAMPLE

A granular dishwashing compsn. contained 38.4% trisodium citrate, 5.0% crystalline layered silicate (I) (i.e.  $\text{NaHSi}_2\text{O}_5.\text{H}_2\text{O}$ ), 6.0%  $\text{Na}_2\text{CO}_3$ , 32.0%  $\text{NaHCO}_3$ , 12.0% Na percarbonate; 3.0% TAED, 1.0% amylase, 1.0% protease, 1.0% 'Plurafac LF 403' (RTM; 12/18C fatty alcohol + EO + 4PO) and 0.6% perfume oil. The mixt. was used at 30g per 5l of water in a mechanical dishwasher operating at 65°C. Decorated plates were still acceptable w.r.t. loss of colour and gloss after 200 washing cycles. (LJ)  
(9pp2400DwgNo.0/0)

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